FLOOD HAZARD ANALYSES

BUFFALO RIVER

AMHERST COUNTY, VIRGINIA

Prepared by

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

In cooperation with

STATE WATER CONTROL BOARD
BUREAU OF WATER CONTROL MANAGEMENT

ROBERT E. LEE SOIL AND WATER CONSERVATION DISTRICT
AMHERST COUNTY

September 1974

UNITED STATES DEPARTMENT OF AGRICULTURE
U.S. SOIL CONSERVATION SERVICE
Richmond, Virginia

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Report of

BUFFALO RIVER FLOOD HAZARD ANALYSES AMHERST COUNTY, VIRGINIA

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Introduction

This Flood Hazard Analysis report was prepared in accordance with a Plan of Study for Buffalo River, approved June, 1973. The study area, location, scope, study responsibilities, estimated costs, funding arrangements, and tentative schedules were briefly described in the Plan of Study.

The principal elements of the report are photographic strip maps showing the area subject to inundation by the 100-year[1]/ flood and the approximate area flooded on August 20, 1969 as a result of Hurricane Camille. Flood profiles show the approximate elevations of flood flows during Hurricane Camille and for the 100-year, 50-year, and 10-year frequency flood events.

The objective of Flood Hazard Analysis is to reduce potential flood losses caused by unwise development of flood plains. This report is to be used by local officials to implement a flood management program to minimize future flood losses and hazard to life along Buffalo River. The delineation of flood zones is to be used as a guide for establishing appropriate ordinances for the regulation of land use and development. The flood zone boundaries and flood profile elevations, as shown in this report, meet the requirements of the Virginia Uniform Statewide Building Code, Section 873.5.

Authorities

The Soil Conservation Service (SCS), U. S. Department of Agriculture, participated in the preparation of this report under authorities of Section 6, Public Law 83-566, as amended; Recommendation 9(c), House Document No. 465, 89th Congress, 2nd Session; Executive Order 11296, August 6, 1965; and Memorandums 1606 and 1607, Secretary, U.S. Department of Agriculture.

State statutes and directives of the Governor of Virginia authorize the Bureau of Water Control Management, State Water Control Board, to coordinate flood hazard surveys and related studies with other State and Federal agencies. Soil and Water Conservation Districts and local governing bodies are appropriately involved in accordance with a Joint Coordination Agreement for Flood Hazard Analysis with the Soil Conservation Service, dated March 1972.

1/ The flood which can be expected to be equaled or exceeded on the average once each 100 years or which would have a one percent chance of being equaled or exceeded in any given year.

Involved Organizations and Responsibilities

The Robert E. Lee Soil and Water Conservation District (District) and the Amherst County Board of Supervisors (County) requested and cosponsored the study. The District provided overall leadership for coordination and development of the report at the local level. The County paid all expenses for cartographic services in connection with printing and finishing the report. The County also obtained permission for field surveys and assisted in providing land use data and available materials.

The State Bureau of Water Control Management received the application, set the priority, and assigned responsibility for development of technical data to the SCS in accordance with a Joint Coordination Agreement.

SCS personnel scheduled and implemented the technical phases of the study. They also prepared the cartographic materials and the final report. The County and District will be responsible for holding public meetings and providing publicity as necessary to implement the intended uses of the report.

History of Flooding

Table 1 lists annual flood peaks at a stream gage about 4 miles downstream from the study area and indicates the history of flooding on upper Buffalo River. Prior to 1969, the largest floods of record at the stream gage were about 20,000 cubic feet per second (cfs) in 1943 and 1944. Losses were limited primarily to highways and bridges, and damages on about 2,800 acres of agricultural lands. From 1945 thru 1968, the larger floods caused relatively moderate damages.

Table 1. Annual peak discharges, Buffalo River near Tye River, Virginia.

(Discharges 1961 to 1973 were recorded at this gage. Discharges for the years 1940 to 1960, estimated from records at a downstream gage prior to relocation at present site, are considered of adequate accuracy for purposes of this table.)

Water Year	Discharge (cfs)	Water Year	Discharge (cfs)	Water Year	Discharge (cfs)
1940	15,500	1951	4,940	1962	6,150
1941	2,250	1952	4,700	1963	3,000
1942	8,150	1953	3,790	1964	1,470
1943	20,000	1954	2,110	1965	6,400
1944	20,000	1955	10,640	1966	3,910
1945	7,730	1956	1,280	1967	5,400
1946	1,370	1957	2,740	1968	1,890
1947	2,300	1958	2,300	1969	45,000
1948	8,820	1959	1,870	1970	3,900
1949	14,020	1960	3,790	1971	4,570
1950	7,190	1961	2,010	1972	36,600
				1973	22,800

Source: Water Resources Data for Virginia, U.S. Geological Survey

In August 1969, Hurricane Camille dumped rainfall estimated up to 15 inches in 8 hours on the watershed of the study area. The recorded peak discharge of 45,000 cfs indicates a recurrence interval much greater than the 100-year flood. The upper Buffalo River watershed narrowly escaped even greater rainfall and flooding. The Tye River tributary of Buffalo River and Rockfish River watersheds directly to the northeast experienced 25-inch, 8-hour rainfalls. At one point, the 12 hour rainfall was estimated at 31 inches. By comparison, the previous maximum rainfall recorded in Virginia was 8.4 inches in 12 hours in 1942 at Big Meadows, about 100 miles northeast.1/ Normal annual precipitation in the study area is about 45 inches.

Restoration and reparation of 1969 damages had not been long completed in June 1972 when Hurricane Agnes struck and produced 36,000 cfs at the stream gage with commensurate flooding and damage in the study area. This estimated 200-year flood and the larger events highlight the needs for realistic appraisal of the flood hazard and for regulation of development in flood prone areas along Buffalo River.

Study Area

The study area comprises about 18 miles along Buffalo River from the Forks of the Buffalo down to the Southern Railway bridge. (See study area map opposite page 15.) Drainage areas at the upper and lower limits of the study area are 16 square miles and 94.5 square miles, respectively.

The Buffalo River rises on the eastern slope of the Blue Ridge Mountains at altitudes ranging up to 4,100 feet above sea level. Slopes of headwater tributaries exceed 1,000 feet per mile. The main stem slope averages about 18 feet per mile through the study area. The Buffalo River flows eastward another 19 miles to its confluence with the James River.

About 74 percent of the watershed above the study area is in woodland, 24 percent in pasture and other agriculture, and about two percent in built-up areas. Limited development of additional built-up areas is anticipated, but continued improvement in woodland management and agricultural conservation practices is expected to result in a net reduction in the rate and volume of flood runoff.

Technical Procedures

The Plan of Study specified that data for the 500-year frequency flood would be included in this report. By mutual agreement, it was decided to substitute data available on the Hurricane Camille flood of August 1969. Elevations of high water marks surveyed after the 1969 flood were used to provide the flood profile and flood zone labeled "Camille (1969)".

1/ Source: Flood of August 1969 in Virginia, U. S. Geological Survey, Richmond, Virginia, 1970

Starting in 1967, the Soil Conservation Service has been assisting the District and other local sponsors in preparing a "PL-566" Watershed Work Plan for Buffalo River. Basic data from this work plan were used to prepare the profiles for the 100-year, 50-year, and 10-year floods. These data were also used to define the 100-year flood zones, without and "with proposed PL-566 project", on the photographic strip maps.

Methods for processing technical data for the watershed work plan are outlined in the SCS National Engineering Handbook, Section 4, and other standard guides and texts.

The procedures involved assignments of values and coefficients bases on physical parameters and present land use conditions of the drainage area. Peak discharges for floods of selected frequencies were determined by flood routing using computer facilities. These discharges were correlated with stream gage records. Adjustment of computer input and reprocessing provided data to show the effects on flood discharges if floodwater retarding structures proposed in the PL-566 Watershed Work Plan were installed.

Computer processing of field survey data for the watershed work plan also provided stage-discharge curves in the study area except above proposed Dam 1B, (see notes on Flood Hazard Area sheet 3 and Flood Profile sheet 3). Additional cross-sections were surveyed and processed to establish stage-discharge relationships.

Elevations for selected flood discharges were established at surveyed cross-sections and a uniform slope assumed between cross-sections to prepare the flood profiles. The elevations at the cross-sections for Camille (1969) and 100-year floods were located on topographic maps, and contour lines were used as a guide to delineate flood zone boundaries between cross-sections. The flood zones were then traced on the photographic strip maps. Where there was no significant difference in the location of the zone boundaries, only one line was shown.

The water surface profiles for the 100-year, 50-year, and 10-year floods were computed assuming that all bridges would remain intact and that no clogging by debris would occur. The Camille (1969) profile was based on highwater marks attained during the flood.

Interpretation for Use of Report

Limitations on Use of Data

The flood stages provided for selected storm frequencies should be considered as minimum elevations for the uses of this report. Certain indeterminate factors and conditions affecting future flood flows could cause greater flood stages than indicated. During floods, debris may collect on bridges and uprooted trees and stumps could clog the channels. Such obstructions would decrease the carrying capacity of bridge openings and channels and increase the depth and extent of flooding. To minimize this hazard, it is suggested that woody debris which might cause such obstructions be removed, and that openings, approach channels, and outfall channels at bridges be kept clear of sediment and trash.

If more intensive or extensive upstream development than anticipated takes place in the future, a reassessment would be necessary to adequately describe flood stages and flood zone boundaries. Similarly, additional encroachments allowed in the flood plain, such as road fills, could cause higher flood stages than indicated in this report. It is recommended that careful consideration be given to these factors in establishing and implementing ordinances for regulation of land use.

Location of Flood Zones

The colored areas on the photo strip maps show the present 100-year flood zone and the approximate area flooded by Camille (1969). Short-dashed lines mark the estimated flood zones on larger tributaries not included in the area for detailed study. A dash-dot line shows the 100-year flood zone "with proposed PL-566 project". The zone limits shown on the maps approximate the location on the ground and can be used for most decisions concerning permits for buildings and other development. The profiles show elevations along the stream in the study area for the 10-year, 50-year, and 100-year floods and approximate profile of Camille (1969).

If required, the precise location of flood lines on the ground can be determined by using the surveyed valley sections as the key reference on photo strip maps and flood profiles:

1. On the appropriate photo strip map, from the point on the stream where the flood line is to be located, scale the distance along the stream to the nearest surveyed cross-section.

2. On the appropriate flood profile sheet, scale the distance determined in Step 1 from the reference cross-section back to the original stream station on the profiles, and read the elevations of the desired flood frequency line.

3. Transfer the elevation determined in Step 2 to the ground from the nearest established bench mark (see below).

U. S. Geological Survey bench marks and temporary bench marks set by the SCS are located on the photo maps, and descriptions and elevations are furnished in Appendix A of this report. It is recommended that permanent bench marks be installed and protected at points along the flood zones where the above procedure will be frequently used for locating flood lines on the ground.

Allowable Uses in Flood Zones

Table 2 outlines the degree of protection suggested for various types of installations and uses. Future developments, such as hospitals (Category 1), should be located above the Camille 1969 flood elevation. Decisions for the location of such installations should be based on the possibility that even larger floods could occur. Residences and similar developments (Category 2) should be above the 100-year flood line.

Storage of salvageable goods, etc. (Category 3) might be incorporated in the lower floors of buildings in which the upper floors are at an elevation to meet protection requirements of Category 2. Care should be exercised that such installations or spoiled material from excavations do not encroach on the flow area of the flood plain.

Regarding open-air markets, theaters, etc. (Category 4), no 25-year flood profiles are provided because there would generally be no significant difference from the 50-year profile. If this exactitude is required, the elevations can be reasonably interpolated as one-fourth the vertical difference from the 50-year elevation to the 10-year flood line on the flood profiles. For Category 4 installations, it is again suggested that care be exercised that excavated spoil does not encroach on the flow area of the floodway. For another reason, it is suggested that generally the 50-year flood line be used to limit the location of Category 4 installations and uses. For example, appurtenances of an open-air theater would tend to retard flood flows and cause higher stages than indicated. The extent and location of such installations could not be predicted and the effects on anticipated flood stages were not considered.

Photos on the following pages roughly indicate stages of Camille (1969) from information provided by local residents and the approximate relative elevation of the present 100-year flood line. Photos should be used only with flood zone strip maps and flood profiles to delineate flood boundaries.

SCS personnel are available to provide further explanation or interpretation of this report upon request. The basic data not included in the report is on file in the offices of the U.S.D.A., Soil Conservation Service, 400 North Eighth Street, P. O. Box 10026, Richmond, Virginia 23240.

Table 2.[1/] Degree of protection suggested in flood zones

Category No.	Uses or Facilities	Degree of Protection Required	Permissible Location & Lowest Water-Entry Elevation
1	Buildings containing valuable documents or data or instruments, or materials dangerous to the public if released by flooding; power installations needed in emergencies; hospitals and like institutions, etc.	Maximum	Outside the area of flood plain floods (see narrative comments).
2	Residential buildings whose occupants may not have adequate warning or means of escape during floods; public service installations needing high protection; permanent memorial cemeteries; etc.	High	Not below the elevation of the 100-year flood, and not in a riverine floodway.
3	Buildings with salvageable or replaceable goods or for storage of readily moved goods, low-cost service shops, etc.	Moderate	Not below the elevation of the 50-year flood, and not in a riverine floodway.
4	Open-air markets or theaters or facilities storing low-cost, non-dangerous materials, etc.	Low	Not below the elevation of the 25-year flood, and not in a riverine floodway (see narrative).
5	Low-value crop or pastureland, picnic grounds, fishing piers, recreation and wildlife use, etc.	Minimum	

1/ From "Flood Hazard Evaluation Guidelines for Federal Executive Agencies", U.S. Water Resources Council, May 1972.

Photo 1. At Route 60 bridge below Forks of Buffalo, Camille overtopped bridge deck and road fill at depth of about 1.5 feet. Bridge capacity is just barely adequate for 100-year flood without overtopping.

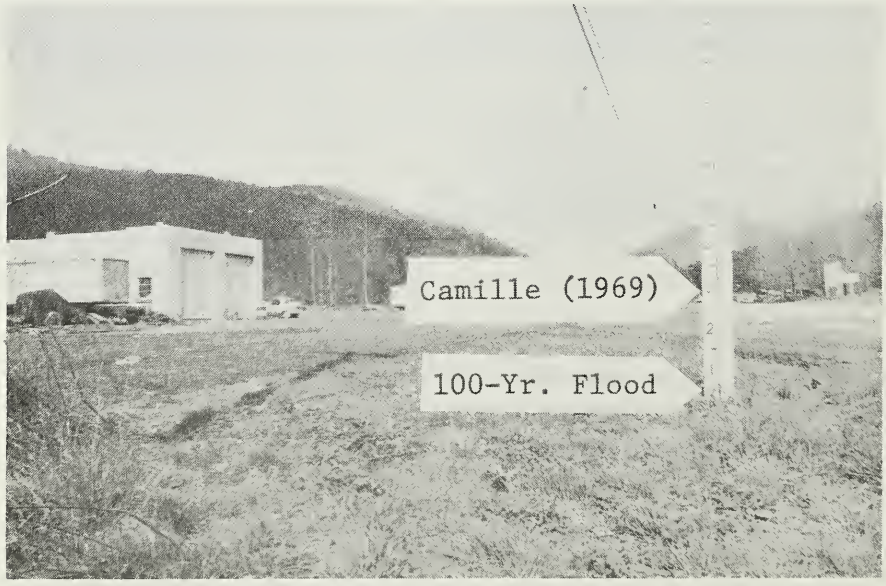


Photo 2. Top of bank of the Buffalo River channel is about the same elevation as Route 60 at this point. Camille flooded the highway in this area. A 100-year storm would inundate low areas on either side of the highway.

Photo 3. At Midway Church near Dodds Store, Camille also flooded low sections of Route 60 in this area. Main stem flows during the 100-year flood would be confined to the south side of the highway, but flows from small tributaries probably would flood low areas on the north side of Route 60.

Photo 4. Near junction of Buffalo River and Puppy Creek, Camille overtopped Route 60 in background. Route 60 bridge (to right of photo area) has adequate capacity for 100-year flow.

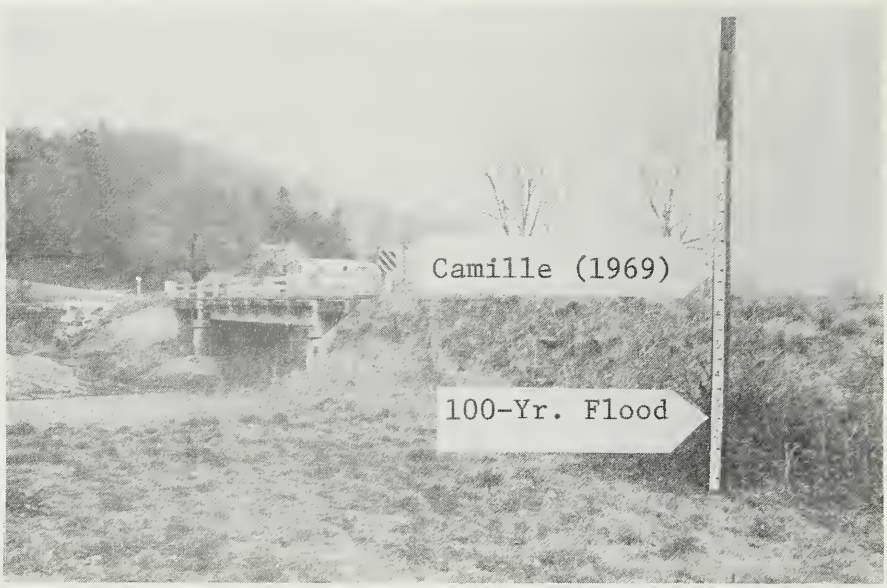


Photo 5. State Route 778 bridge at Henley's Store. Camille overtopped bridge deck by depth of about 3 feet. Bridge capacity is barely adequate for 100-year flood flow.

Photo 6. Directly upstream from Route 29, the main stem and tributary flows of Camille appear to have peaked simultaneously at this relatively narrow valley section to reach the elevation indicated at this concrete mixing plant. The 100-year storm would cause a considerably lower stage.

GLOSSARY OF TERMS

backwater - High water caused by downstream obstruction or restriction, or by high stage on an intersecting stream.

cfs - Cubic feet per second (unit of discharge).

cross section - Shape and dimensions of a channel and valley perpendicular to the line of flow.

detention pool - See flood pool

elev.-bridge deck - Elevation of a roadway across a bridge or culvert.

elev.-low beam - Elevation of lowest structural "beam" that limits the height of the bridge opening; or may indicate the top of a culvert opening.

elev.-low road - Elevation of low point on a roadway approaching or crossing a bridge or culvert.

fifty-year frequency flood or 50-year flood - See flood frequency

five-hundred year frequency flood or 500-year flood - See flood frequency

flood - An overflow of lands not normally covered by water; a temporary increase in streamflow or stage; or the discharge causing the overflow or temporary increase.

flood frequency - An expression of how often a flood of given magnitude can be expected. (Note: the word "frequency" often is omitted to avoid monotonous repetition.)
Examples:
10-year flood or 10-year frequency flood - The flood which can be expected to be equaled or exceeded on an average once in 10 years; and which would have a 10 percent chance of being equaled or exceeded in any given year.
50-year flood - .... two percent chance .... in any given year.
100-year flood - .... one percent chance .... in any given year.
500-year flood - .... two-tenths percent chance .... in any given year.

flood peak or peak discharge - The highest stage or discharge attained during a flood.

flood plain or flood-prone area - Lands adjoining a stream (or other body of water) which has been or may be covered with water.

flood pool or detention pool - Reservoir storage for temporary retention of floodwaters.

flood profile or profile - A plotted line showing the highest water surface elevations along a stream during a particular flood.

flood-prone area - See flood plain

flood routing - Computation of the changes in the rise and fall in streamflow as a flood moves downstream. The results provide hydrographs of discharge versus time at given points on the stream.

floodwater retarding structure - A dam, usually of earthfill, providing a reservoir for temporary storage of floodwaters. Storage for other purposes may also be included.

frequency-discharge curve - A plotted line showing the frequency of various flood discharges at a surveyed cross section or other point along a stream. (Used with a stage-discharge curve to determine the high water elevations resulting from selected flood discharges at that point on the stream.)

hydrograph - A plotted curve showing the rise and fall of flood discharge with respect to time at a specific point on a stream.

land use - Classification of type of vegetation, or other surface cover conditions on a watershed used (with a similar classification of soils) to indicate the rate and volume of flood runoff.

one-hundred year frequency flood or 100-year flood - See flood frequency

peak discharge or flood peak - The highest rate of runoff (discharge) attained during a flood.

profile - See flood profile

runoff - That portion of the total storm rainfall flowing across the ground or other surface and contributing to the flood discharge.

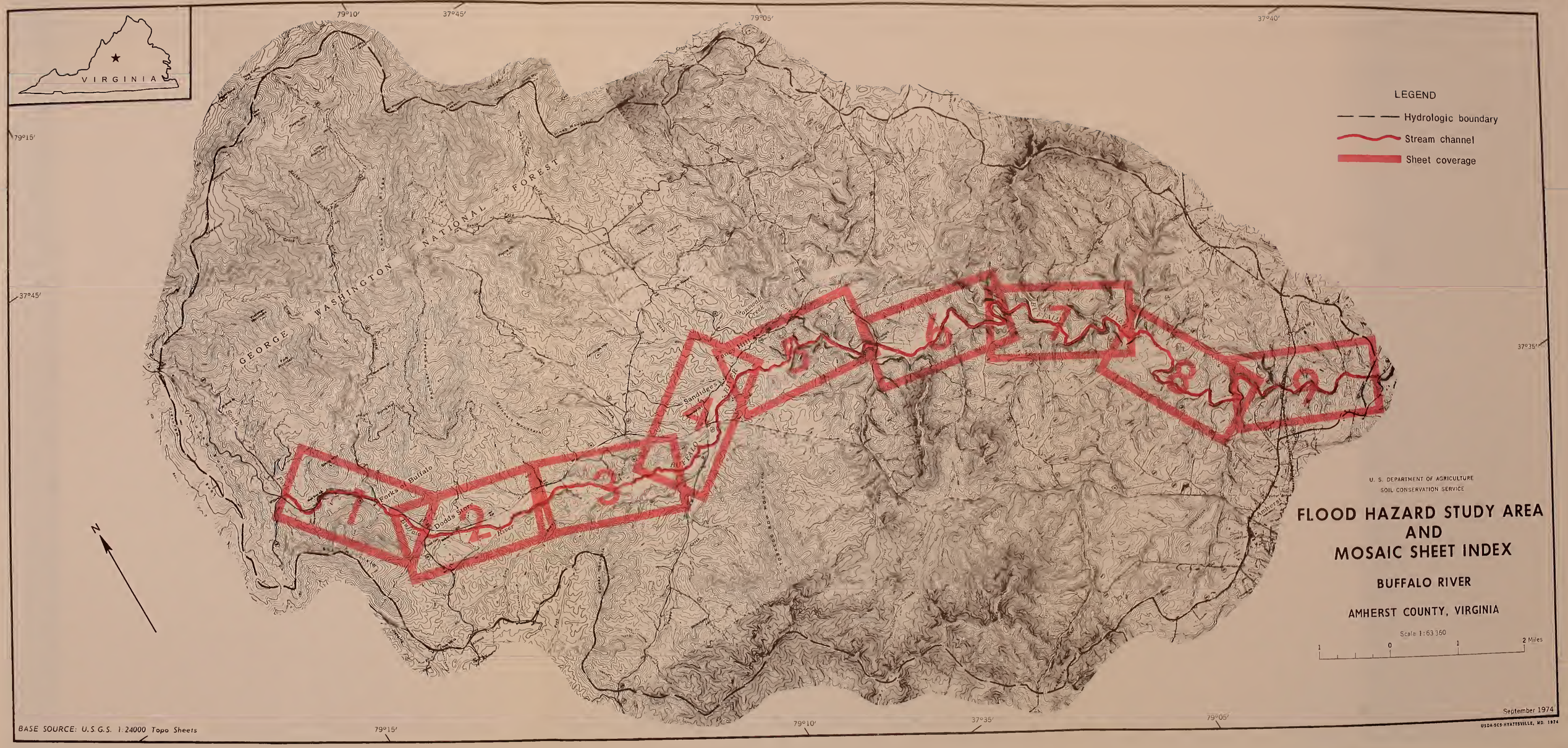
stage-discharge curve - A plotted curve showing elevations resulting from a range of discharges at a surveyed cross section, stream gage, or other point on a stream.

ten-year frequency flood or 10-year flood - See flood frequency

watershed - A drainage area which collects and transmits runoff to the outlet of the drainage basin.

Appendix A. Temporary bench marks established by SCS along Buffalo River, Amherst County, Va., 1967 and 1973

TBM Number : Photo Sheet No.:	Description and Elevation
	(Descriptions listed in order as located on Flood Hazard Study photo maps starting near Forks of Buffalo on Sheet 1 of 9. Several USC&GS bench marks are included.)
TBM 1 Sheet 1 of 9	In Amherst County, Virginia, on the U.S. Route 60 bridge over Buffalo River at Forks of the Buffalo, a square is chiseled on the southeast corner of the bridge. Elev. 940.12
BM 2 USGS BM 69 Sheet 2 of 9	In Amherst County, Virginia, 2.2 miles north of the community of Allwood, 0.7 miles east of Forks of the Buffalo, and 35 feet west of the intersection of State Route 635 and U.S. Route 60, a standard tablet stamped "BC 69 1934" is in a concrete post approximately 100 feet west of Dodd's Store. Elev. 876.98
BM 3 USC&GS BM V-151 Sheet 3 of 9	In Amherst County, Virginia on Route 60, 1.5 miles east of Dodd's Store, 54 feet south of the centerline of Route 60, and 21 feet east of the center of a field entrance road, a USC&GS marker stamped "V-151 1935" is set in a concrete post 30 feet east of a frame barn on the south edge of Route 60. Elev. 795.11
TBM 4 Sheet 3 of 9	In Amherst County, Virginia, approximately 1000 feet beyond the end of state maintenance on State Route 802, on the centerline station 5 + 50 of the proposed PL-566 Dam No. 1B (centerline bearing S 40" 40'W), and 212 feet northeast of Buffalo River, a square is chiseled into a rock outcrop. Elev. 739.00
TBM 5 Sheet 4 of 9	In Amherst County, Virginia on the State Route 610 bridge over Franklin Creek at U.S. Route 60, a cross is chiseled into the southeast abutment of the concrete Route 610 bridge. Elev. 690.89
TBM 6 Sheet 4 of 9	In Amherst County, Virginia, approximately 0.25 miles east of the community of Sandridges on State Route 610, a square is chiseled into the southeast corner of the Route 610 bridge over Thrashers Creek. Elev. 674.84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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD STUDY AREA
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BUFFALO RIVER
AMHERST COUNTY, VIRGINIA
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September 1974
USDA-SCS-HYATTSVILLE, MD. 1974

SOURCE: Semi-Controlled Mosaic prepared from USDA-ASCS Aerial photography flown 1971

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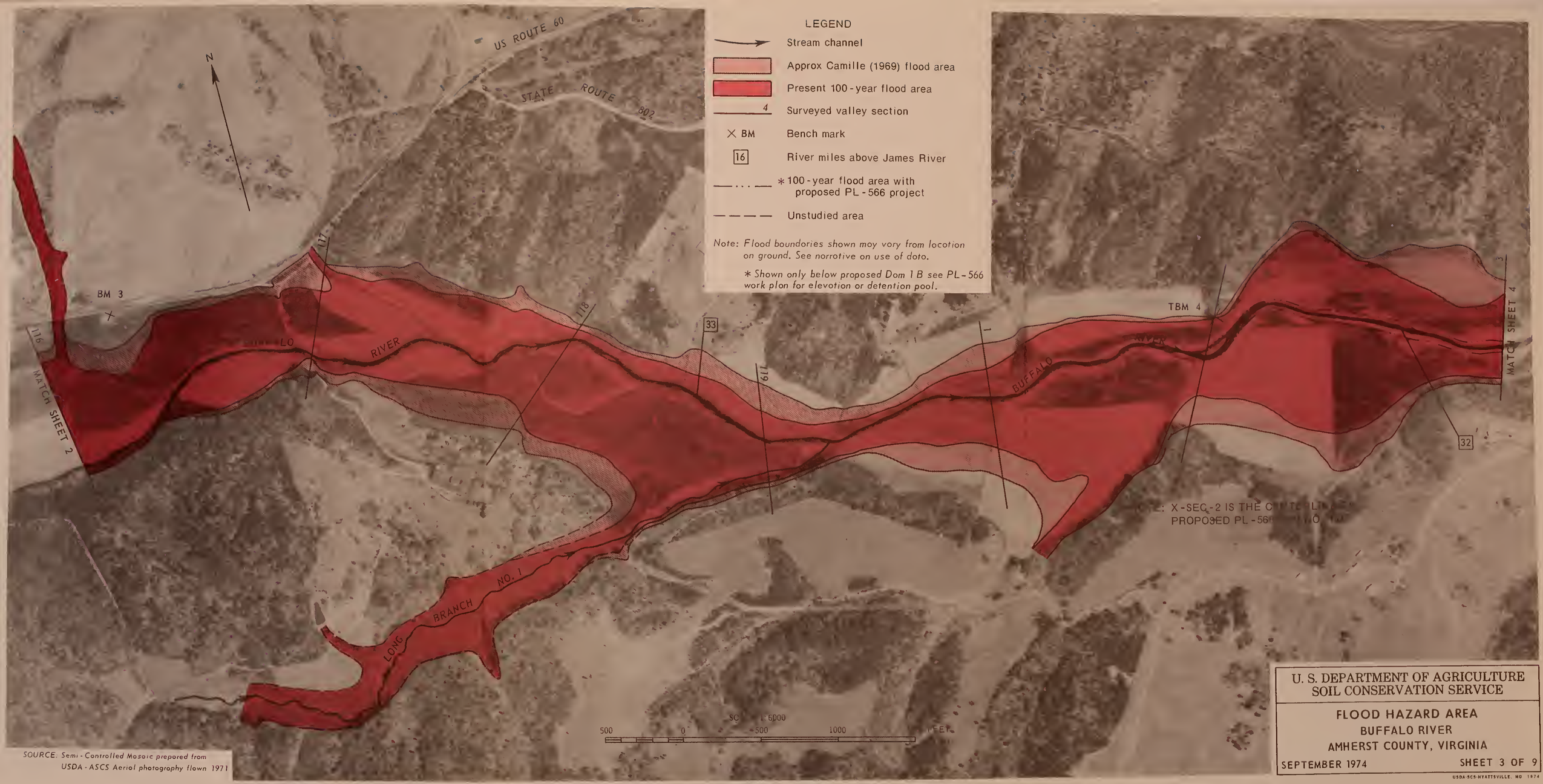

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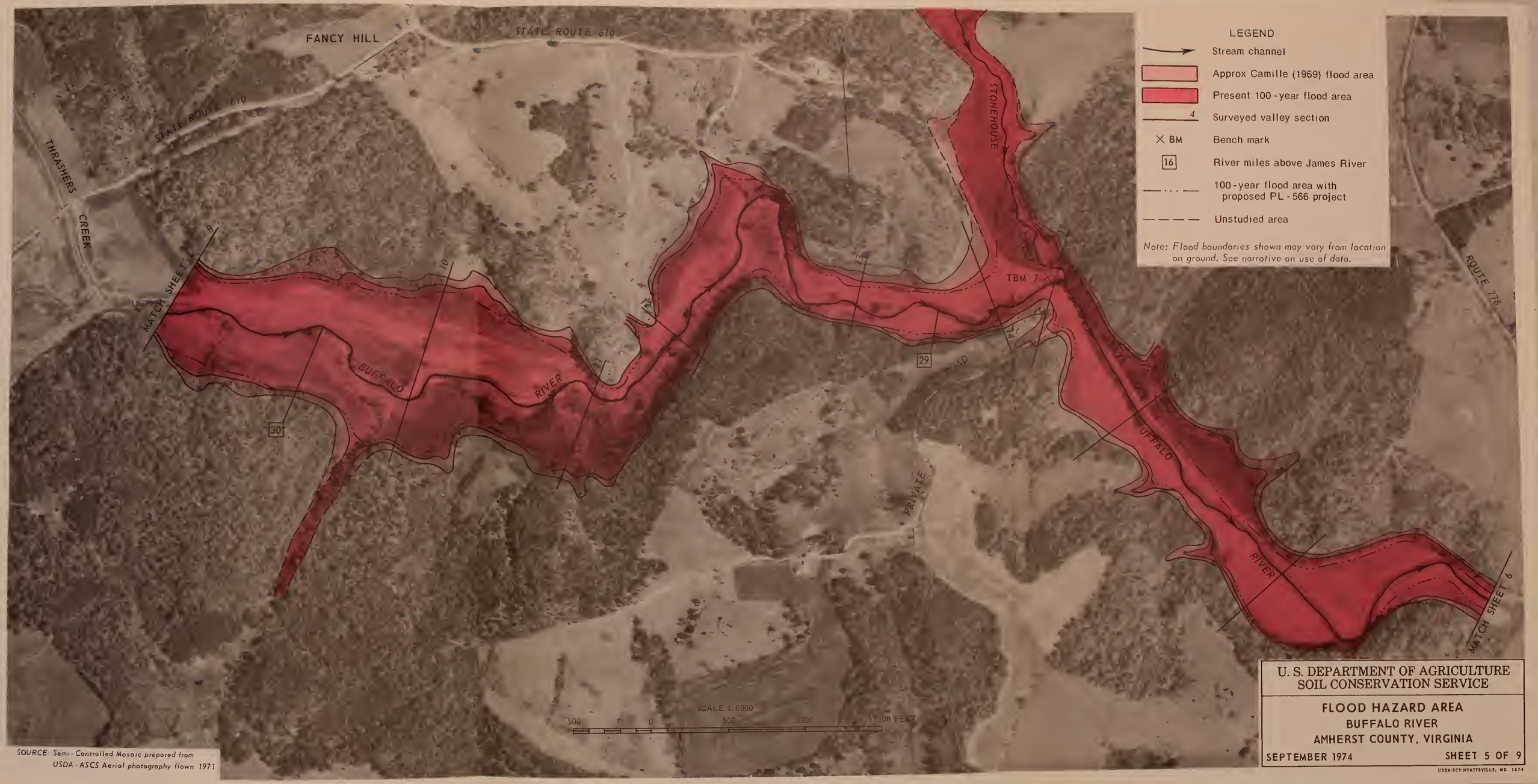

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BUFFALO RIVER
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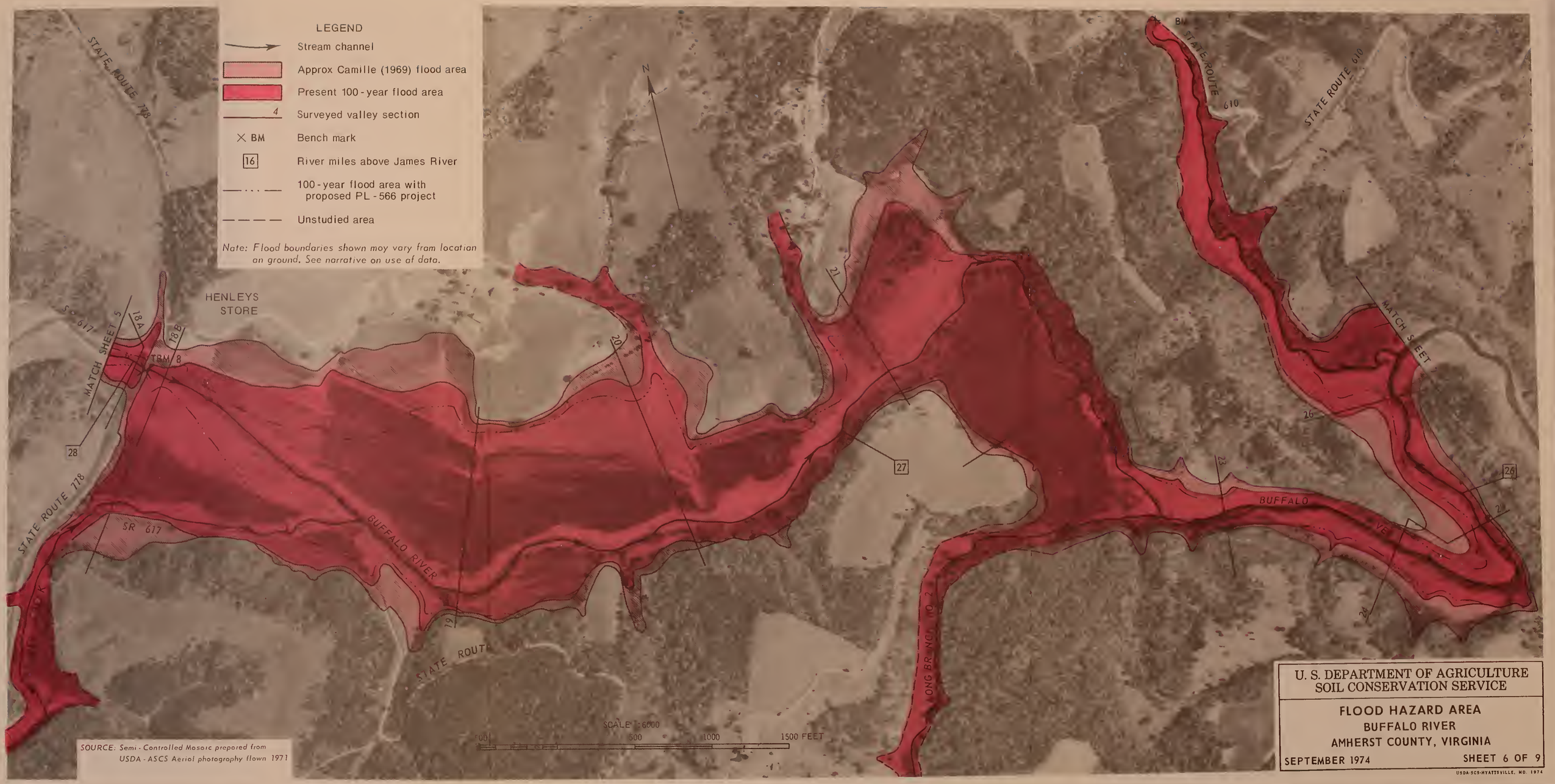

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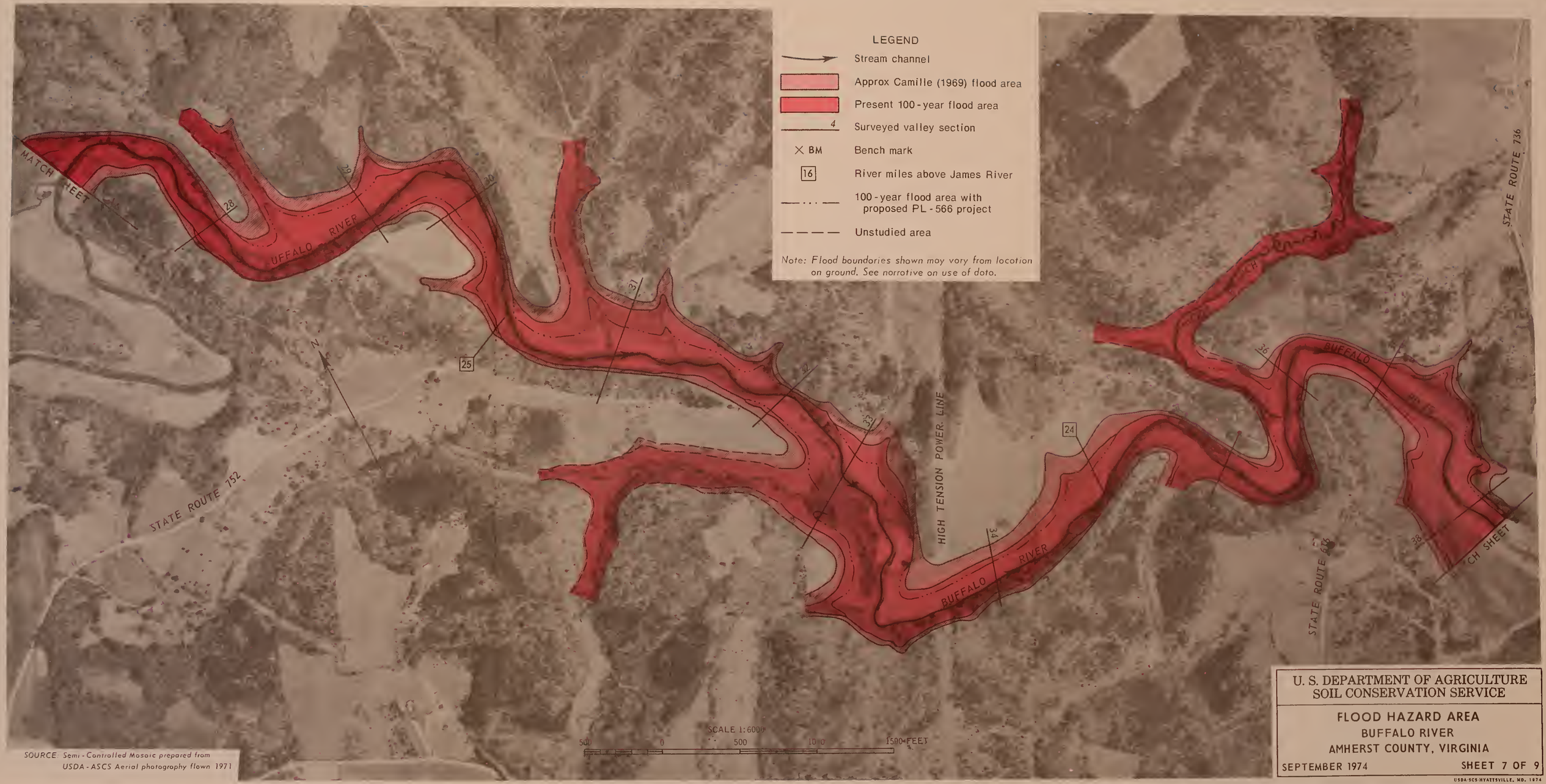

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BUFFALO RIVER
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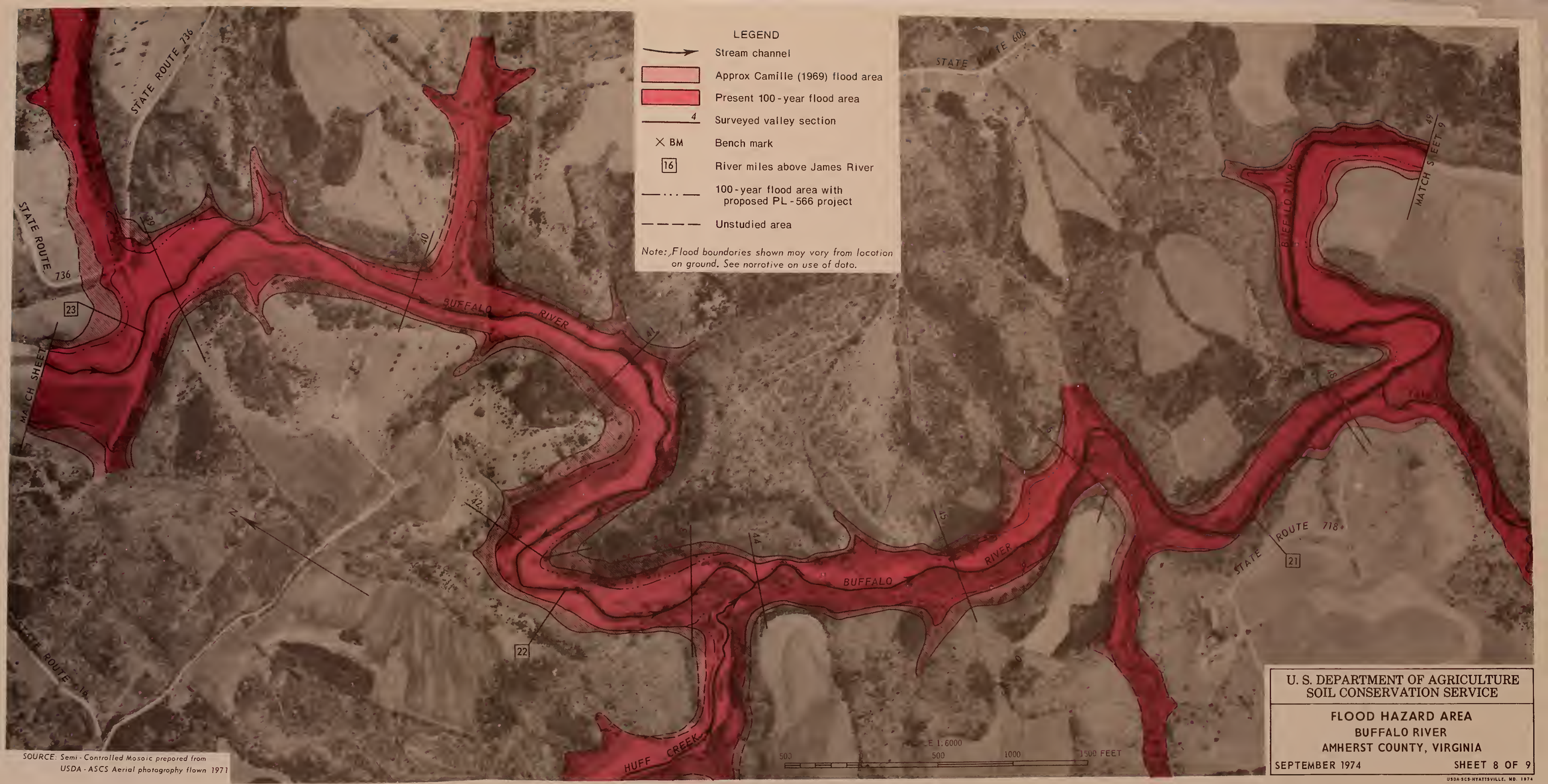

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BUFFALO RIVER
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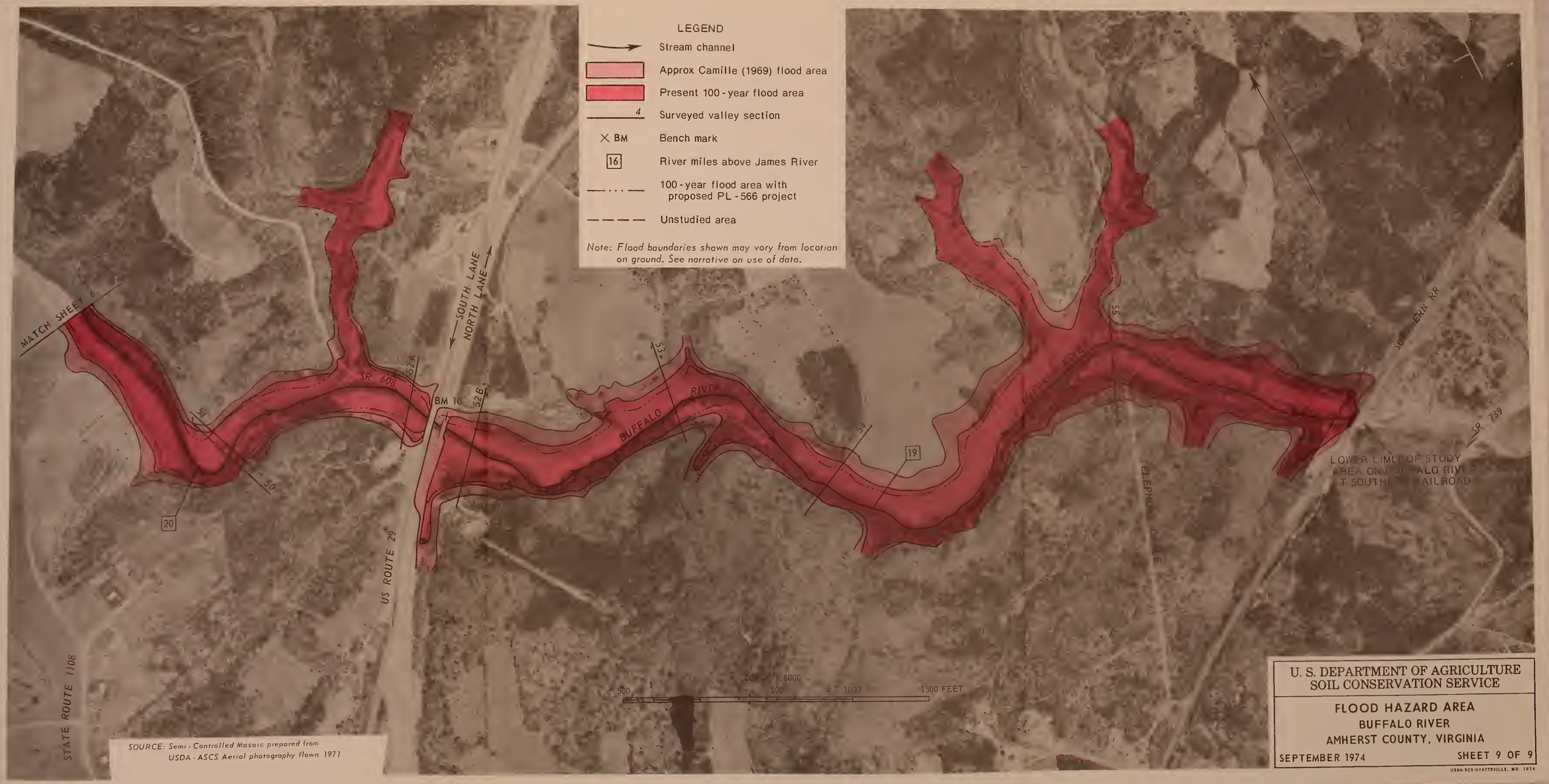

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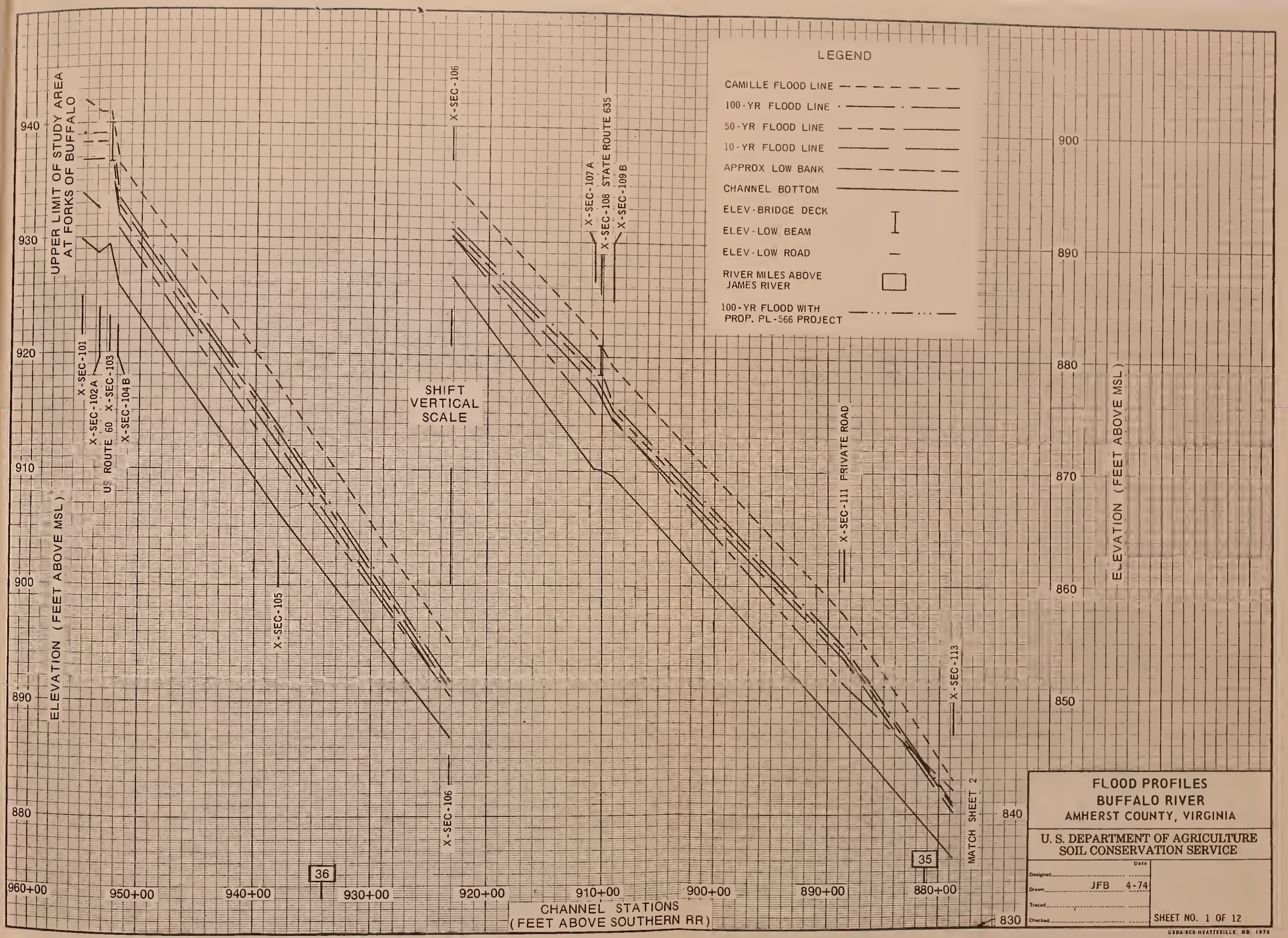

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

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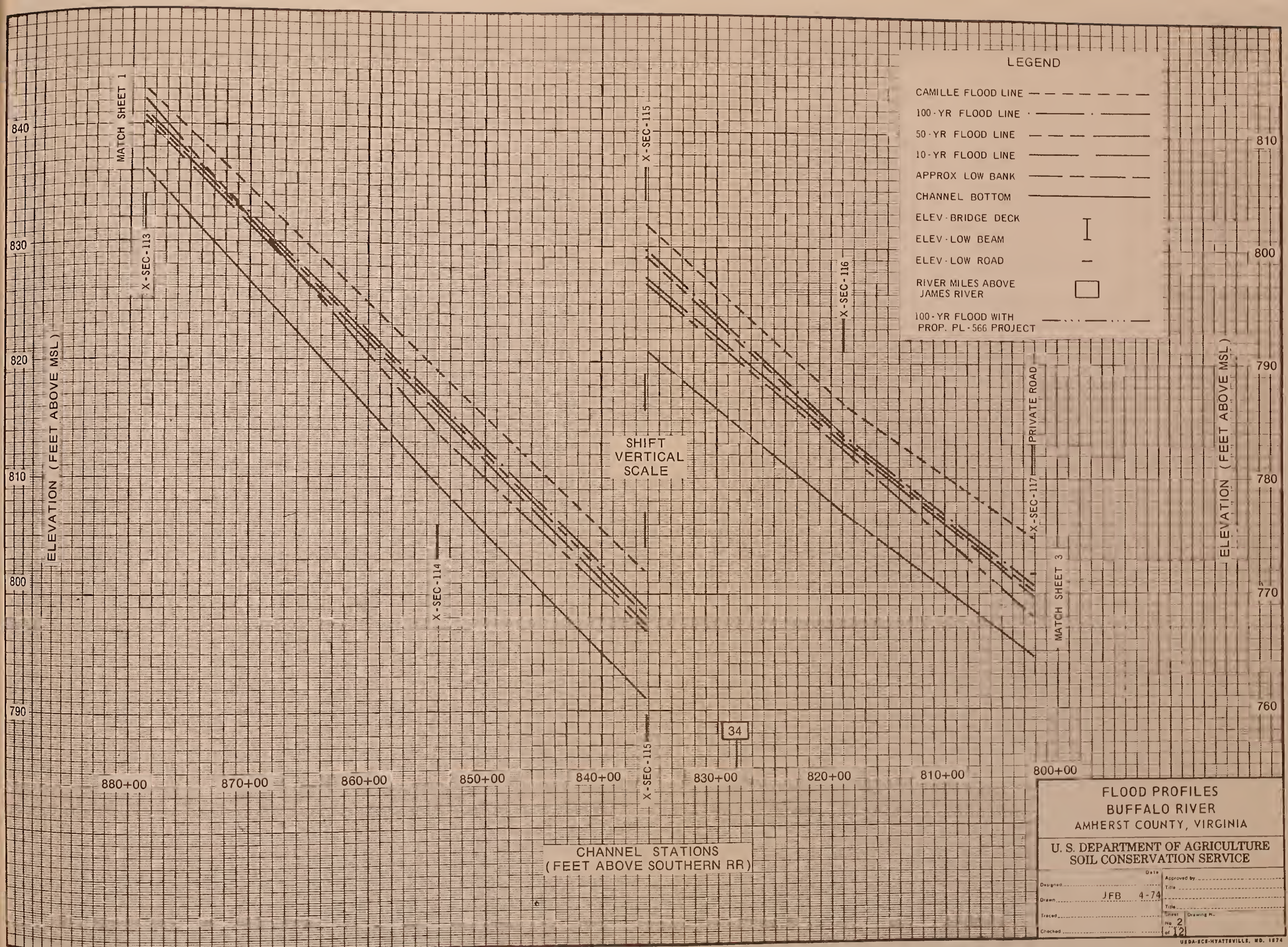

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

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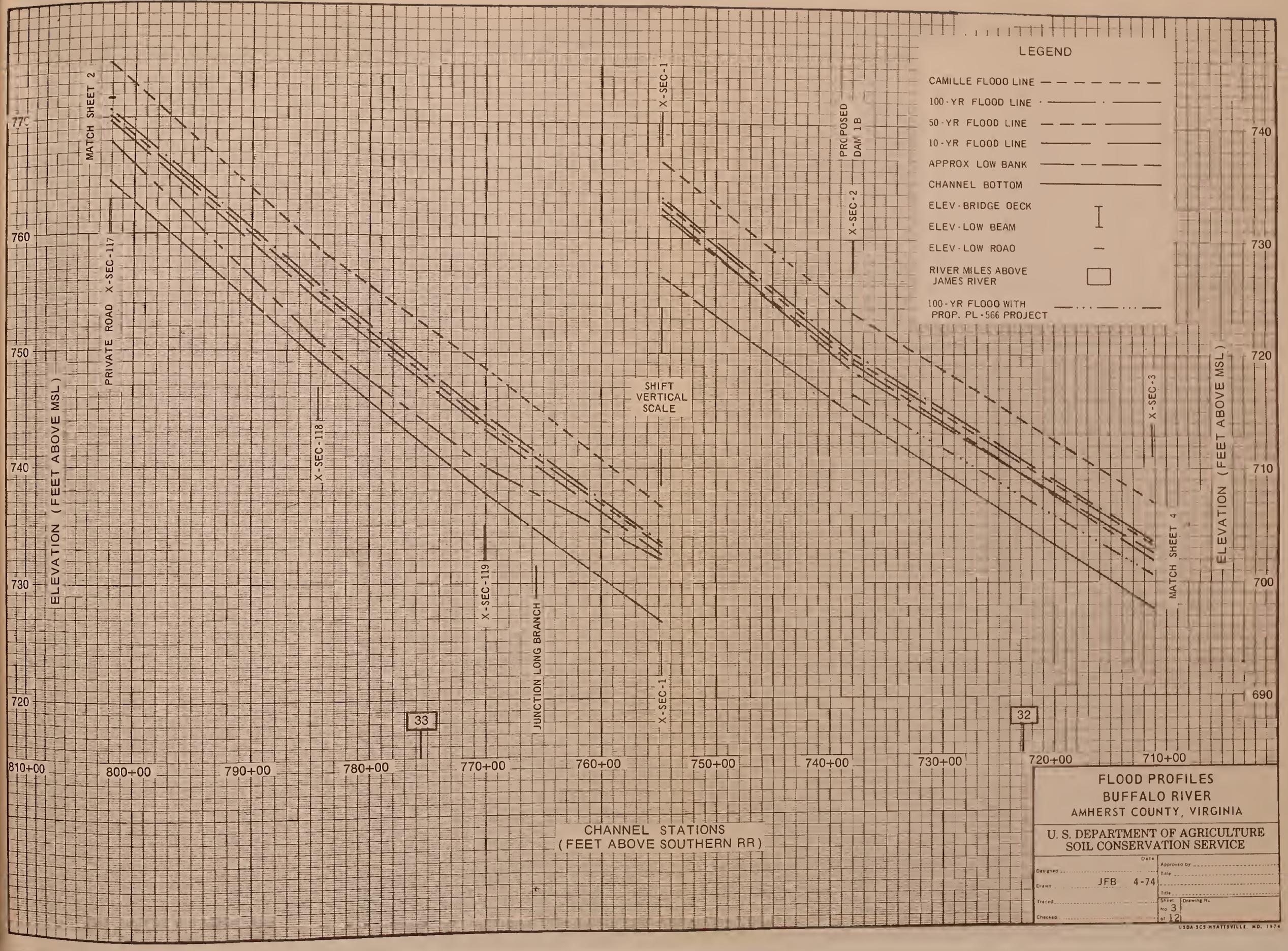

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

	Date		
Designed		Approved by	
Drawn	JFB 4-74	Title	
Traced		Title	
Checked		Sheet No. 3 of 12	Drawing No.

USDA-SCS-HYATTSVILLE, MD. 1974

MATCH SHEET 3

X-SEC-3

X-SEC-4A

X-SEC-4 STATE ROUTE 610

X-SEC-4B

JUNCTION PUPPY CREEK

X-SEC-5

X-SEC-6A

X-SEC-6 US ROUTE 60

X-SEC-6B

JUNCTION FRANKLIN CREEK

X-SEC-7

RIVATE ROAD

X-SEC-8

MATCH SHEET 5

LEGEND

- CAMILLE FLOOD LINE
- 100-YR FLOOD LINE
- 50-YR FLOOD LINE
- 10-YR FLOOD LINE
- APPROX LOW BANK
- CHANNEL BOTTOM
- ELEV-BRIOGE DECK
- ELEV-LOW BEAM
- ELEV-LOW ROAO
- RIVER MILES ABOVE JAMES RIVER
- 100-YR FLOOD WITH PROP. PL-566 PROJECT

ELEVATION (FEET ABOVE MSL)

710
700
690
680
670
660

31

720+00 710+00 700+00 690+00 680+00 670+00 660+00 650+00 640+00 630+00

CHANNEL STATIONS
(FEET ABOVE SOUTHERN RR)

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
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Traced		Title	
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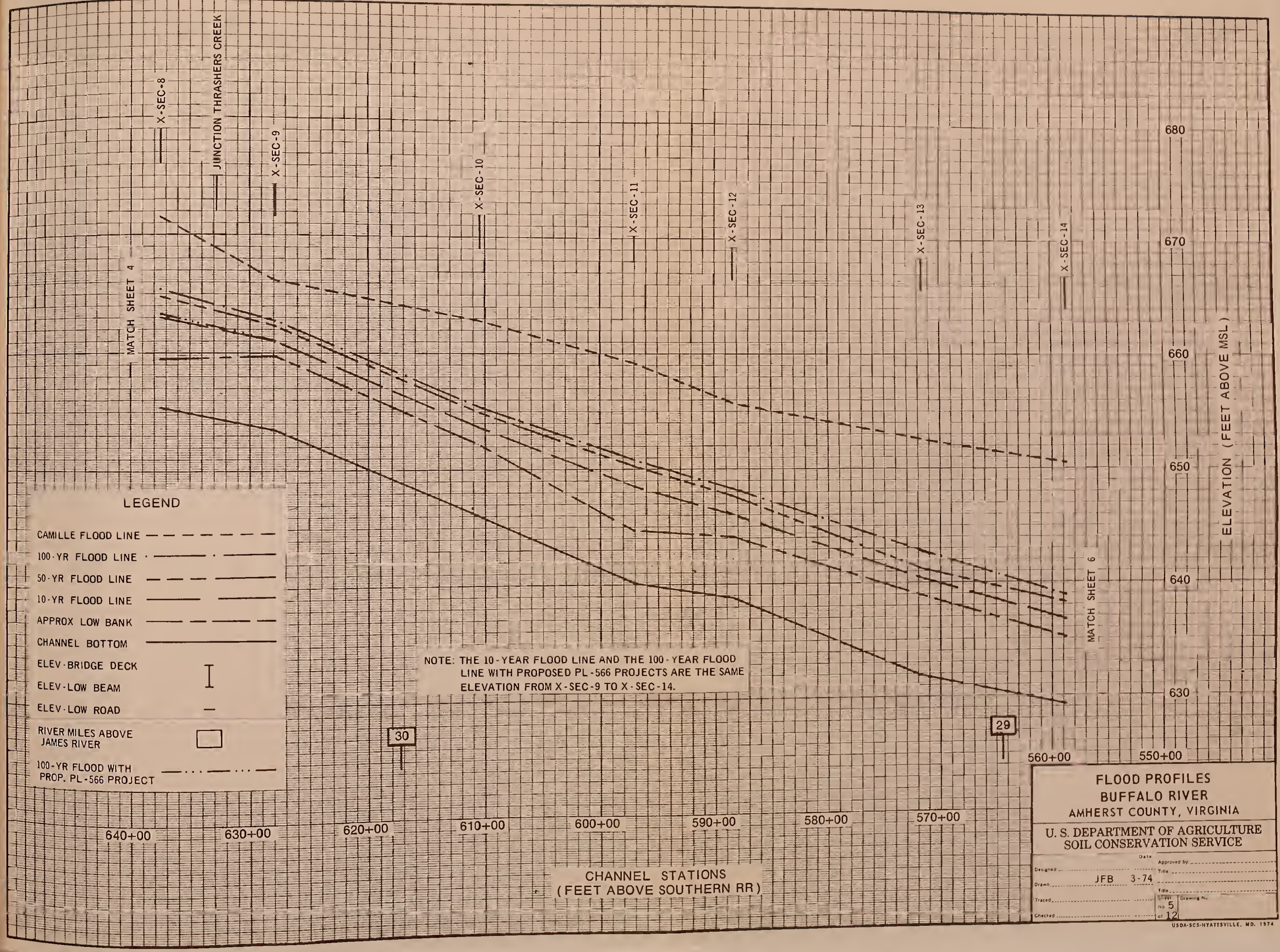

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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MATCH SHEET 5

X-SEC-14

JUNCTION STONEHOUSE CREEK

X-SEC-15

X-SEC-16

X-SEC-17

X-SEC-18A

X-SEC-18 STATE ROUTE 778

X-SEC-18B

JUNCTION BEAVER CREEK

X-SEC-19

MATCH SHEET 7

ELEVATION (FEET ABOVE MSL)

660

650

640

630

620

610

LEGEND

CAMILLE FLOOD LINE

100-YR FLOOD LINE

50-YR FLOOD LINE

10-YR FLOOD LINE

APPROX LOW BANK

CHANNEL BOTTOM

ELEV-BRIDGE DECK

ELEV-LOW BEAM

ELEV-LOW ROAD

RIVER MILES ABOVE JAMES RIVER

28

100-YR FLOOD WITH PROP. PL-566 PROJECT

560+00 550+00 540+00 530+00 520+00 510+00 500+00 490+00 480+00

CHANNEL STATIONS
(FEET ABOVE SOUTHERN RR)

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
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Traced		Title	
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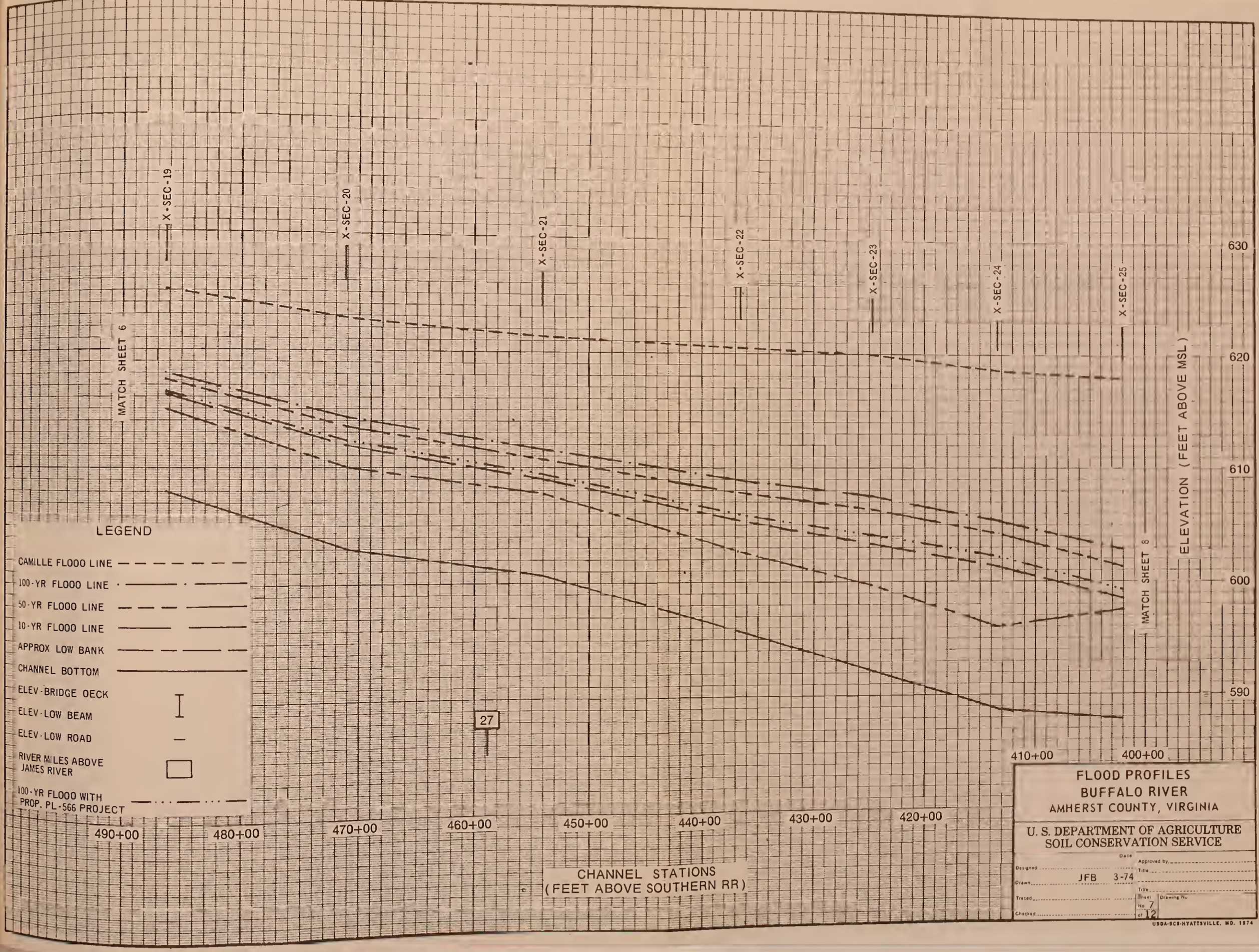

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
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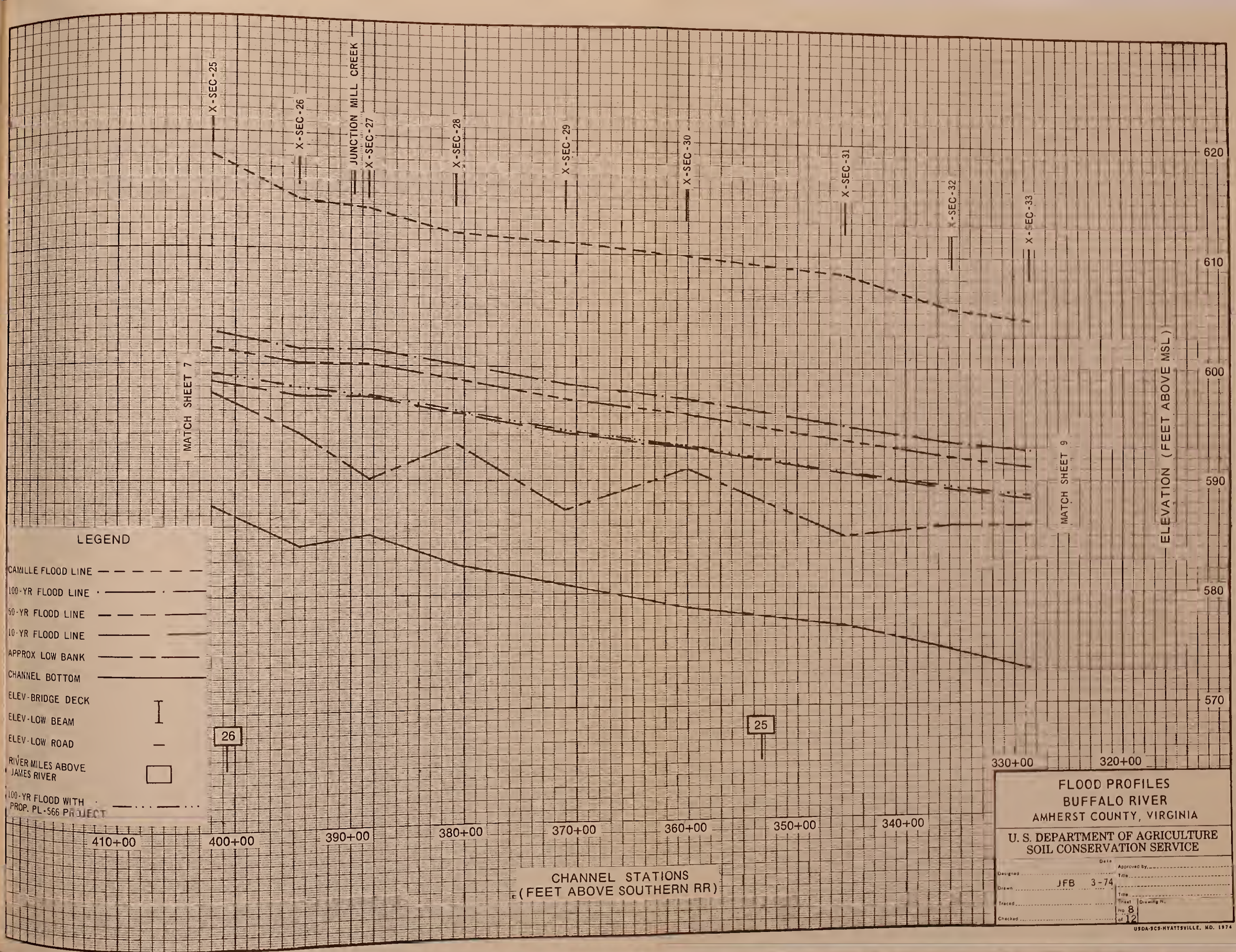
Date
Approved by
Title
Title
Sheet No. 7 of 12
Drawing No.

USDA-SCS-HYATTSVILLE, MD. 1974



FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
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	Date		
Designed		Approved by	
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Traced		Title	
Checked		Tract	Drawing No. 8 of 12

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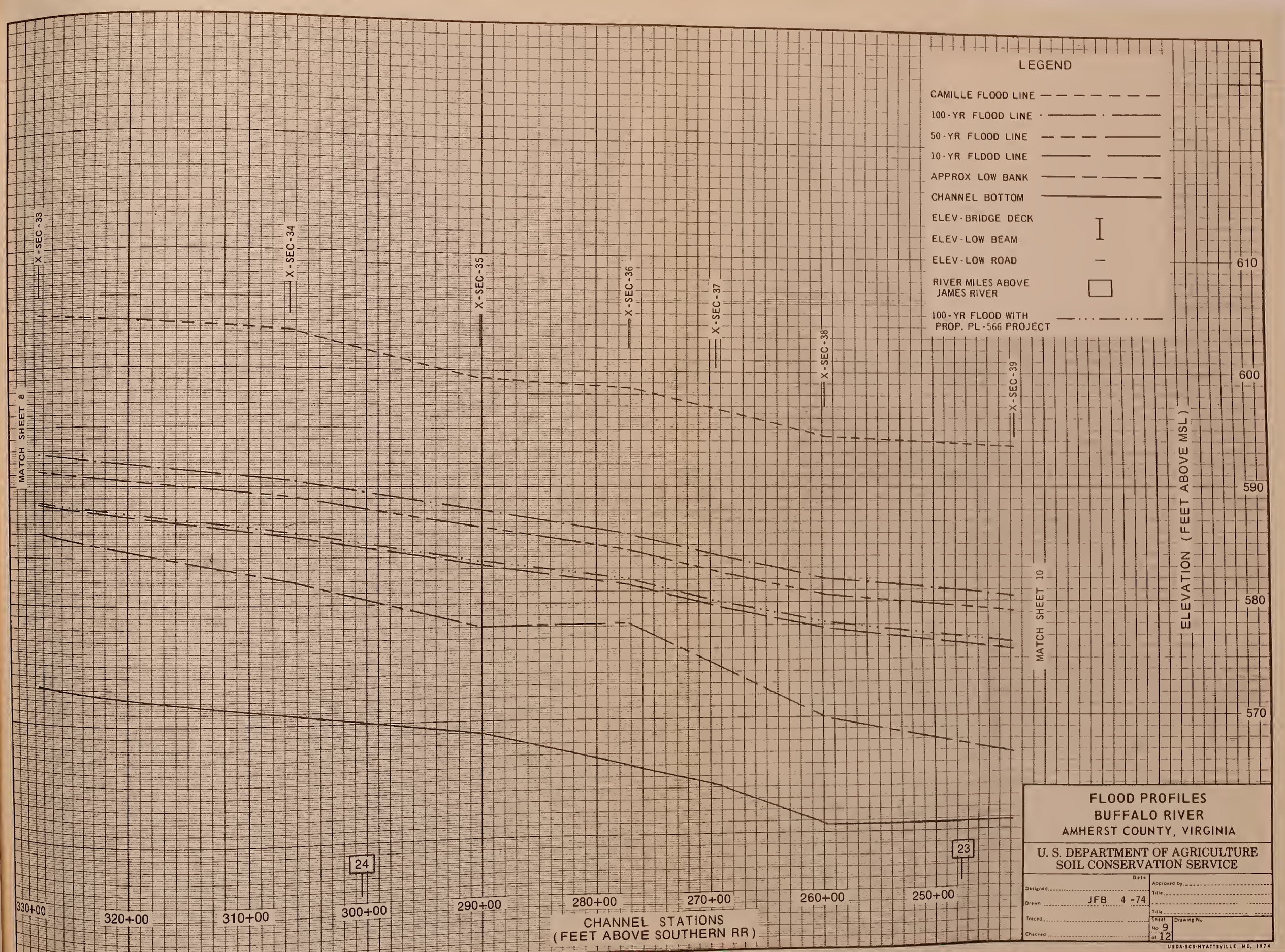

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
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	Date		
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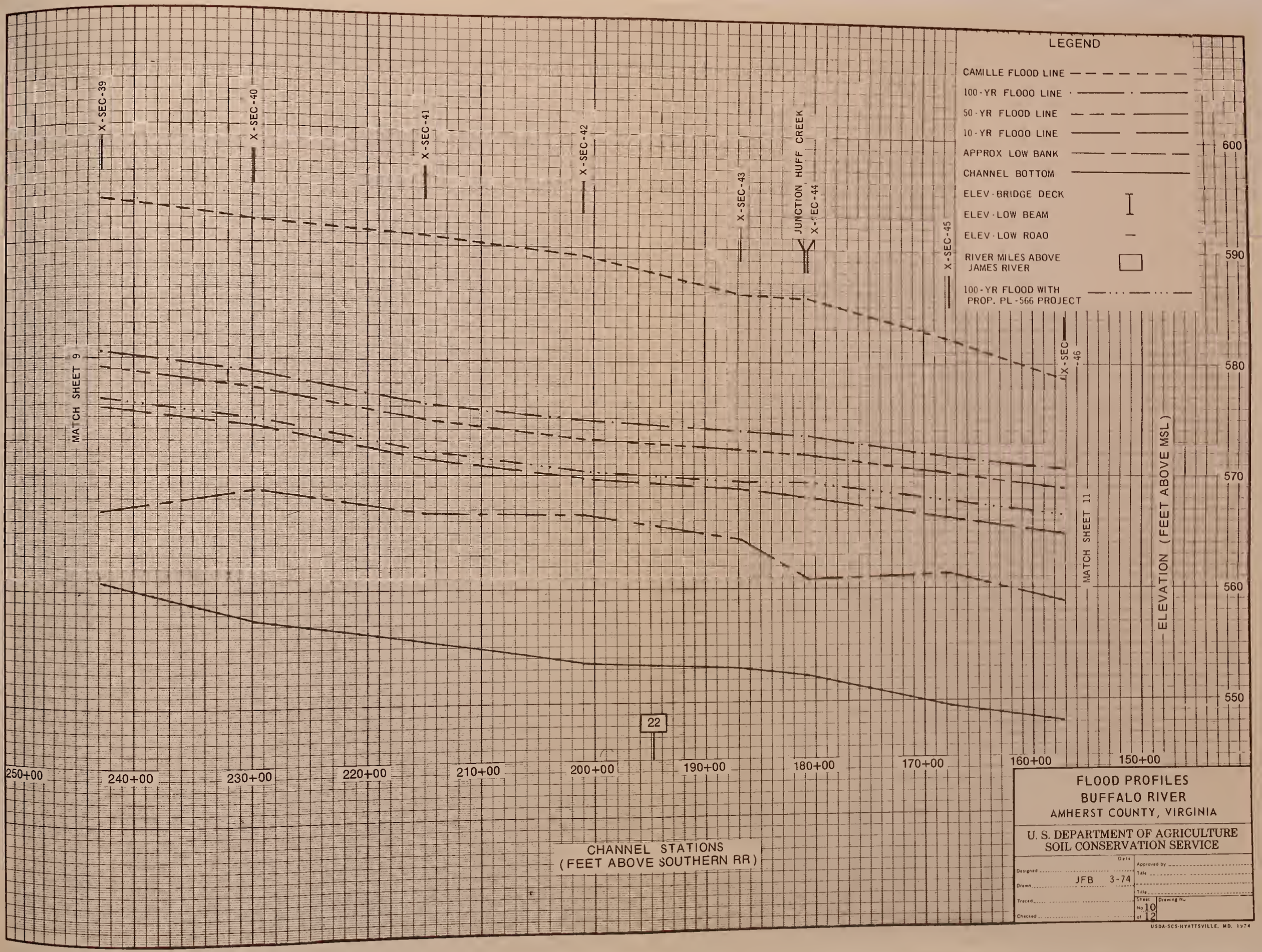
LEGEND
CAMILLE FLOOD LINE
100-YR FLOOD LINE
50-YR FLOOD LINE
10-YR FLOOD LINE
APPROX LOW BANK
CHANNEL BOTTOM
ELEV-BRIDGE DECK
ELEV-LOW BEAM
ELEV-LOW ROAD
RIVER MILES ABOVE JAMES RIVER
100-YR FLOOD WITH PROP. PL-566 PROJECT
X-SEC-39
X-SEC-40
X-SEC-41
X-SEC-42
X-SEC-43
JUNCTION HUFF CREEK
X-SEC-44
X-SEC-45
X-SEC-46
MATCH SHEET 9
MATCH SHEET 11
ELEVATION (FEET ABOVE MSL)
600
590
580
570
560
550
22
250+00
240+00
230+00
220+00
210+00
200+00
190+00
180+00
170+00
160+00
150+00
CHANNEL STATIONS
(FEET ABOVE SOUTHERN RR)
FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA
U. S. DEPARTMENT OF AGRICULTURE
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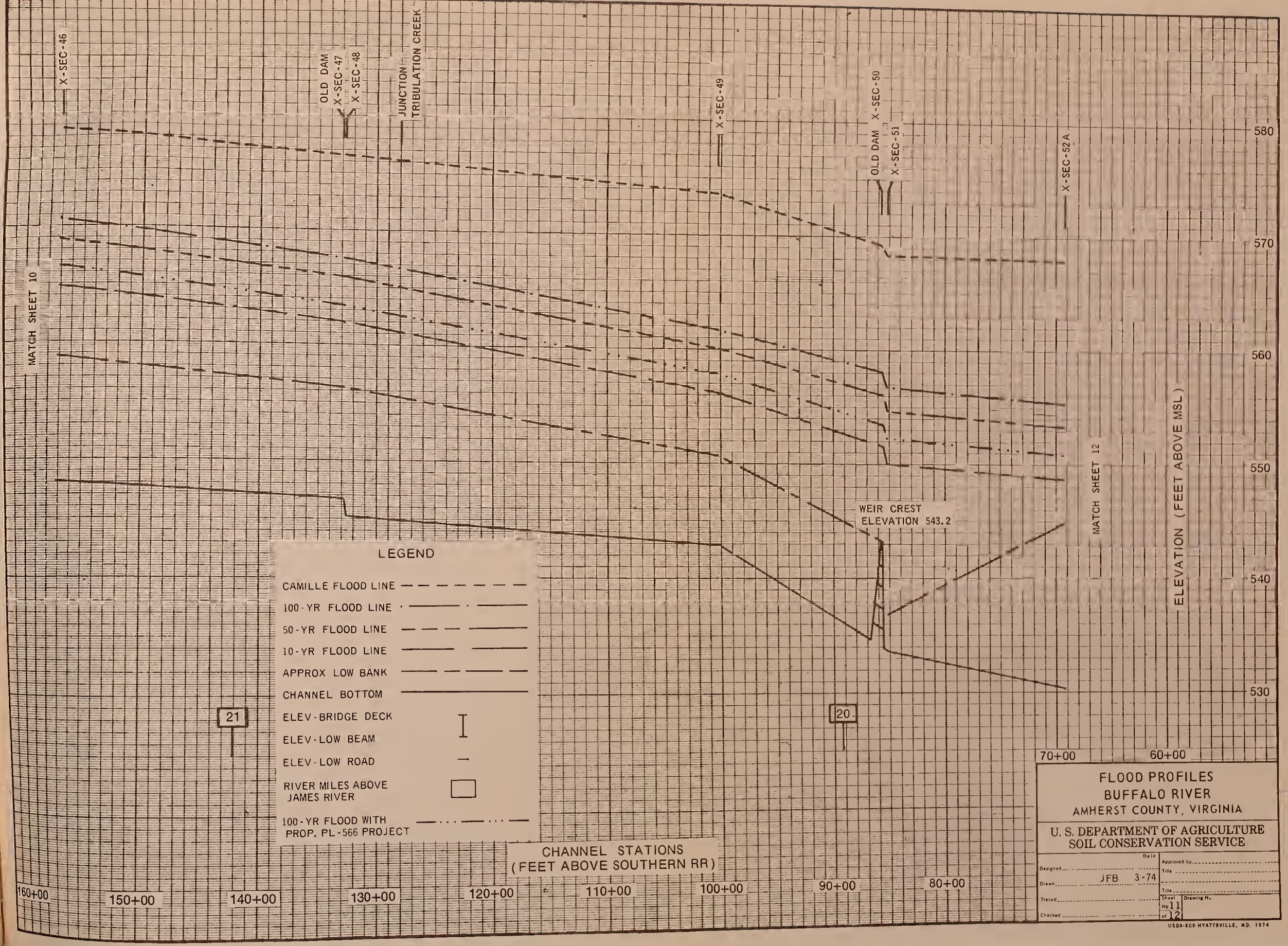

FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
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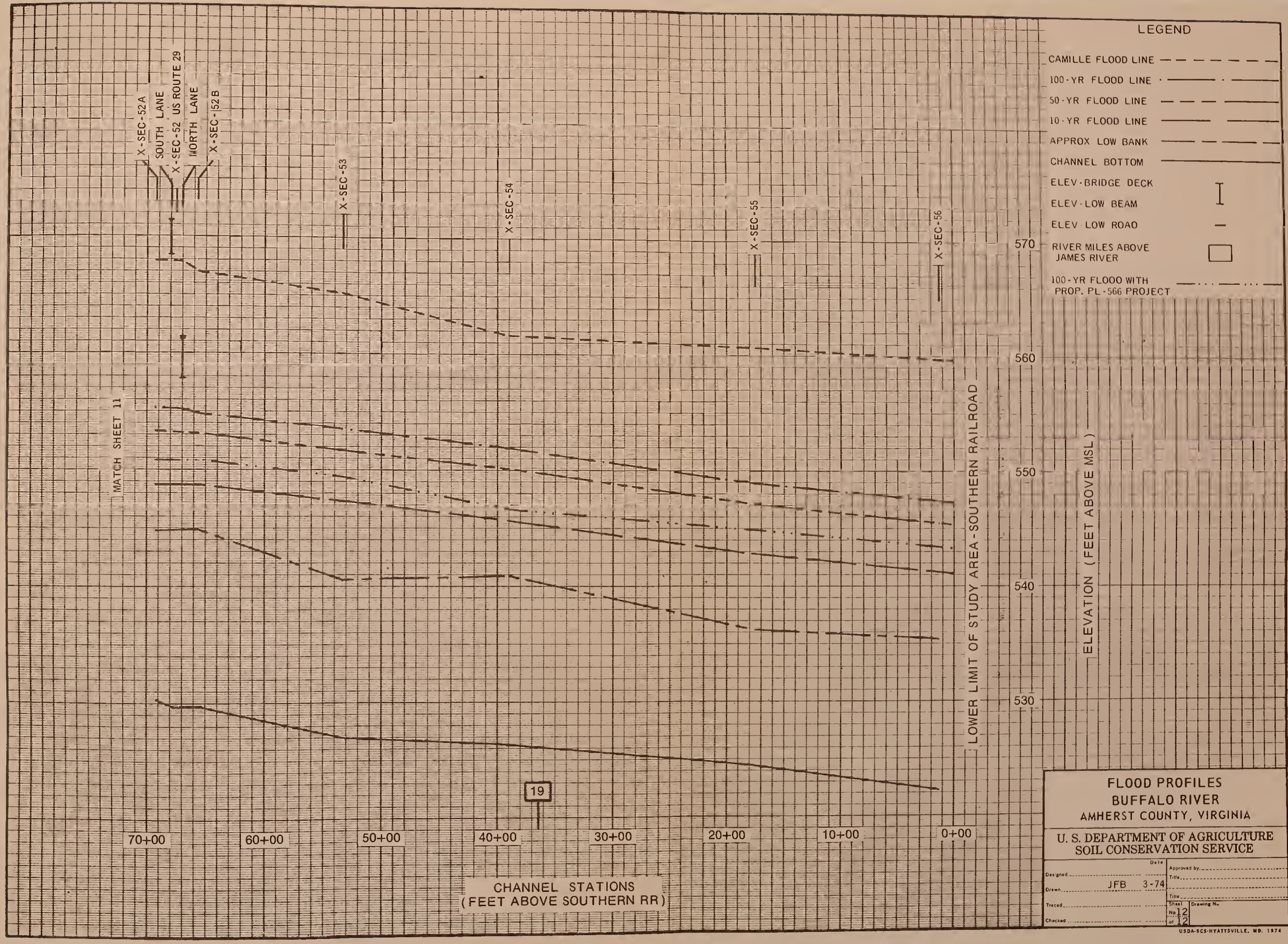
LEGEND
CAMILLE FLOOD LINE
100-YR FLOOD LINE
50-YR FLOOD LINE
10-YR FLOOD LINE
APPROX LOW BANK
CHANNEL BOTTOM
ELEV-BRIDGE DECK
ELEV-LOW BEAM
ELEV LOW ROAD
RIVER MILES ABOVE JAMES RIVER
100-YR FLOOD WITH PROP. PL-566 PROJECT
X-SEC-52A
SOUTH LANE
X-SEC-52 US ROUTE 29
NORTH LANE
X-SEC-52B
X-SEC-53
X-SEC-54
X-SEC-55
X-SEC-56
MATCH SHEET 11
LOWER LIMIT OF STUDY AREA-SOUTHERN RAILROAD
570
560
550
540
530
ELEVATION (FEET ABOVE MSL)
19
70+00
60+00
50+00
40+00
30+00
20+00
10+00
0+00
CHANNEL STATIONS
(FEET ABOVE SOUTHERN RR)
FLOOD PROFILES
BUFFALO RIVER
AMHERST COUNTY, VIRGINIA
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Drawing No.
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